

R. CARL.

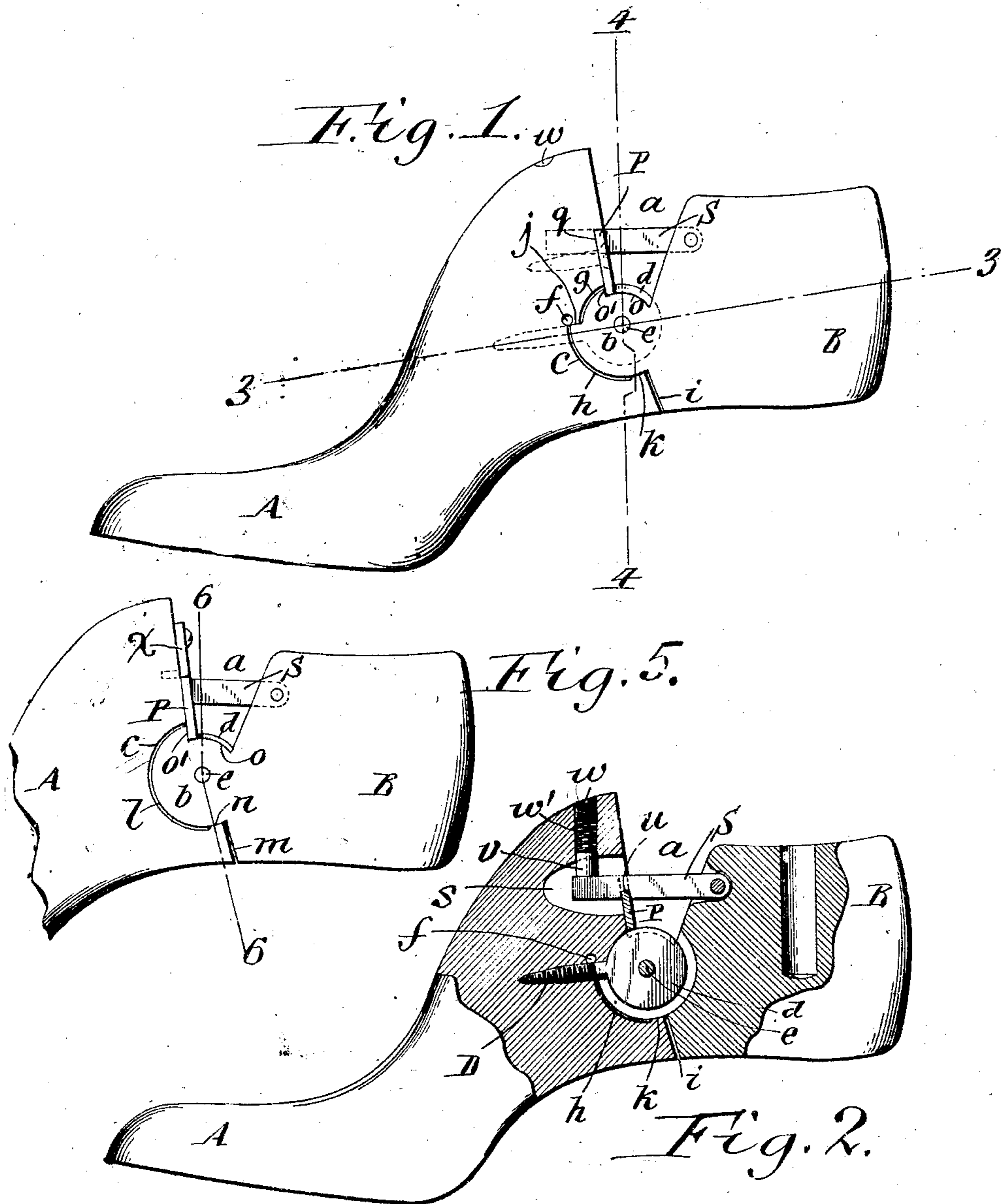
LAST.

APPLICATION FILED MAR. 16, 1910.

969,244.

Patented Sept. 6, 1910.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 3.

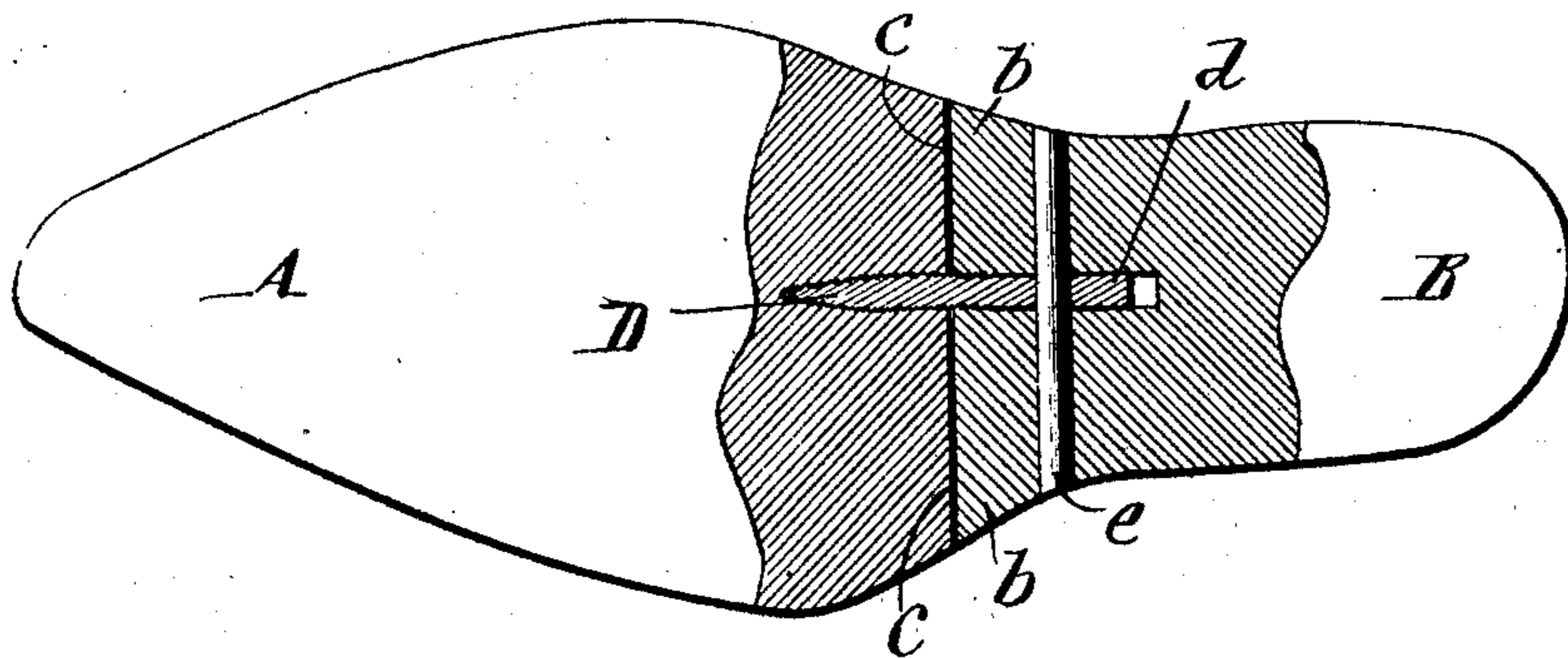


Fig. 4.

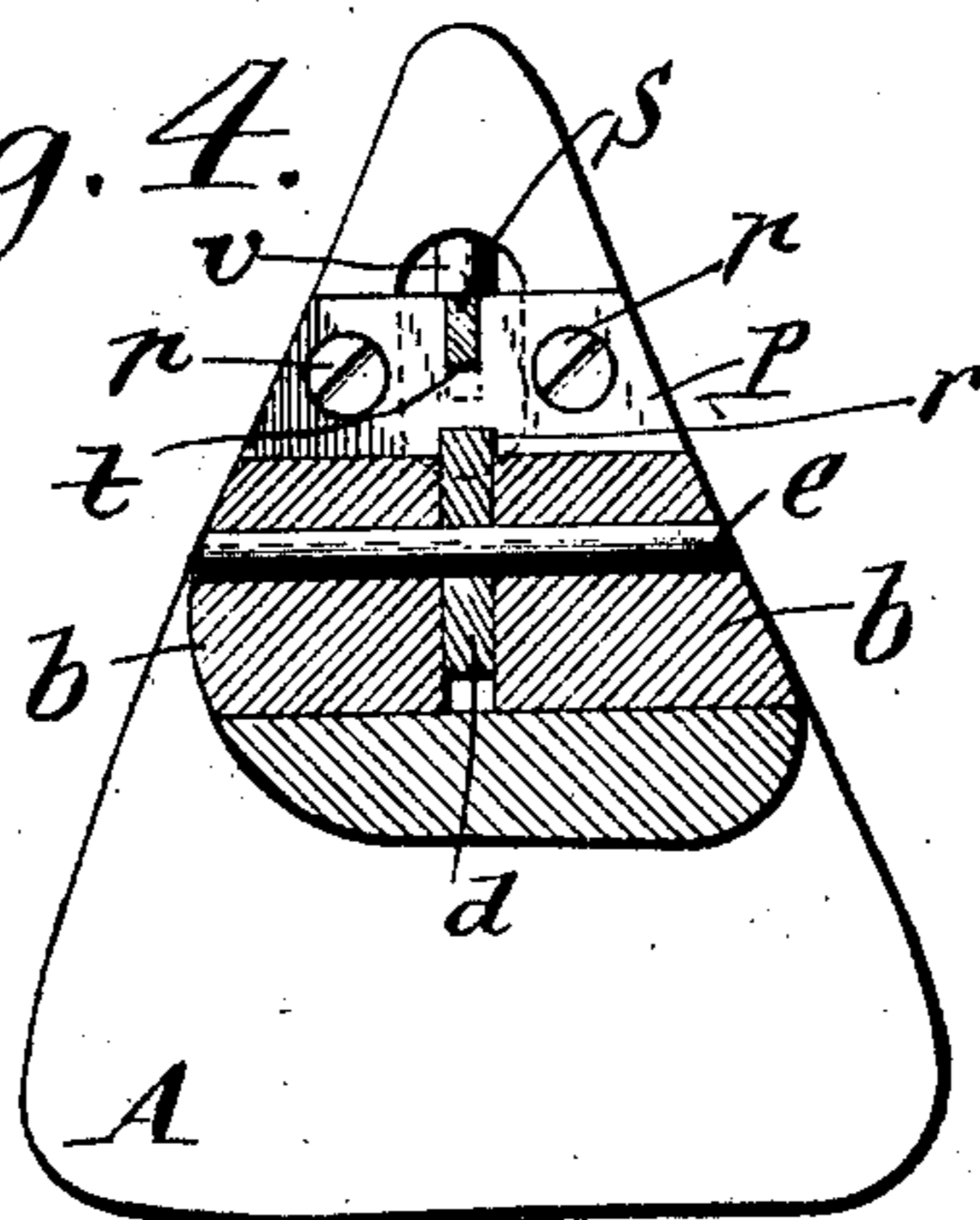
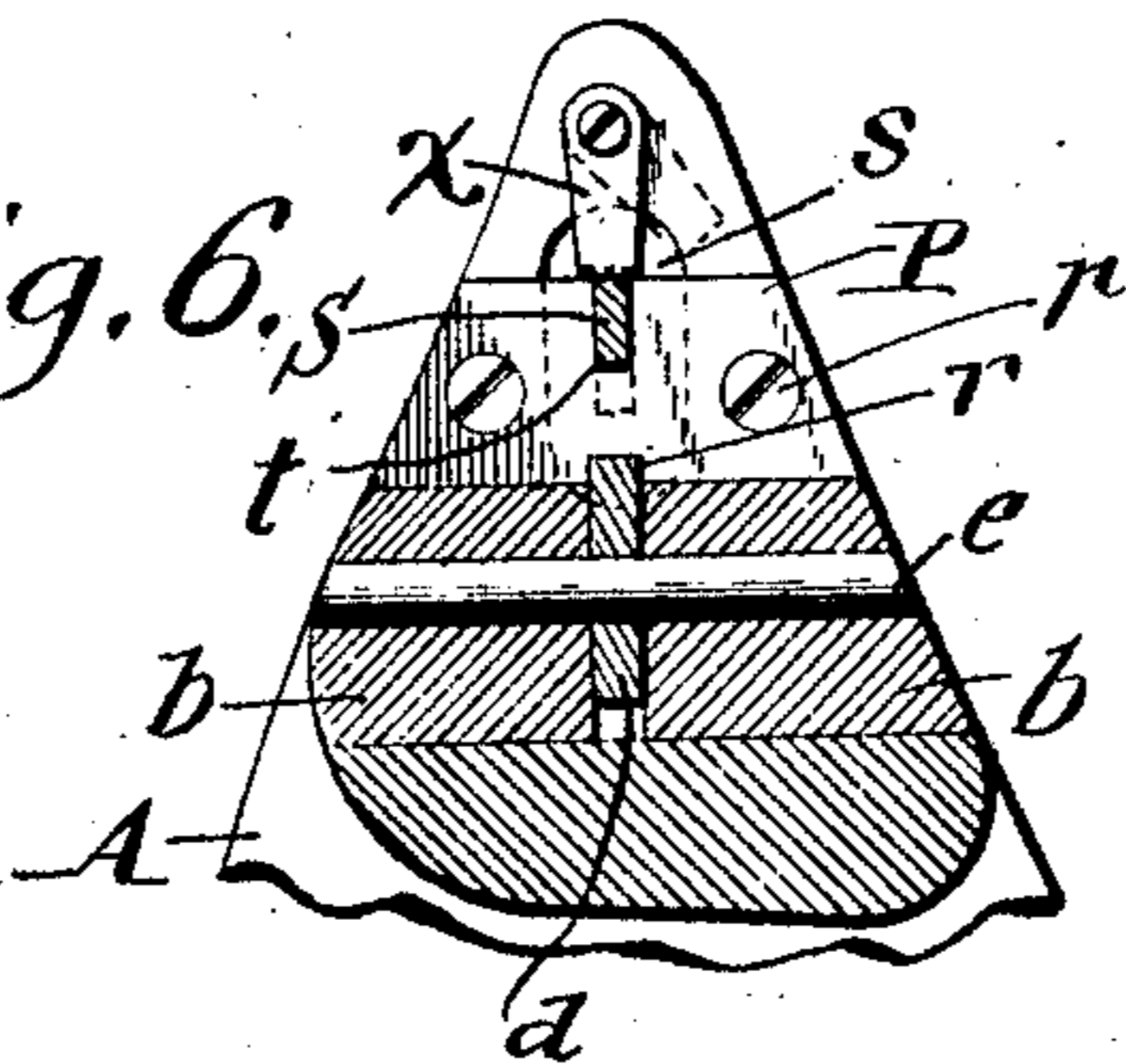


Fig. 6.



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UNITED STATES PATENT OFFICE.

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LAST.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, RUDOLF CARL, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Lasts, of which the following is a specification.

This invention relates to that class of lasts which are capable of folding to permit of inserting the same into a shoe and removing the same therefrom during the manufacture thereof.

Great difficulty has been experienced heretofore in keeping the front or toe section and the rear or heel section of the last in alinement inasmuch as the pressure to which the shoe and the last is subjected by the leveling machine which tends to wear the connections between the last sections very rapidly. When this wear becomes pronounced it is necessary to discard the last if accurate workmanship is desired.

When cutting the front and rear sections of the last from the same piece of wood in such manner that one part or section has an integral curved knuckle which turns in a correspondingly shaped socket in the other part or section, these parts, when assembled in the manner heretofore practiced, require a filling piece or shim to be inserted in the joint between the knuckle and socket to compensate for the material which is removed by the kerf or cut of the saw which separates the two sections of the last from each other. This not only involves additional cost in the manufacture of the last but also renders it practically impossible to secure a perfect bearing of the knuckle in the socket.

One of the objects of this invention is to produce a last of this character in which the front and rear sections are separated in such manner that the knuckle and socket can bear firmly against each other without the necessity of employing any filling pieces or shims.

Another object of this invention is to reinforce the last sections while in an unfolded condition so as to more effectually resist the strains or pressures to which they are subjected by the leveling or other machines during the operation of building a shoe on the same.

My invention has the further object to provide an improved locking device which reliably holds the last sections in their un-

folded position and aids in resisting the destructive action of the leveling machine, which can be readily unlocked to permit of folding the last and removing the shoe therefrom and which is automatically shifted into its operative position for holding the last sections in an unfolded position.

In the accompanying drawings consisting of 2 sheets: Figure 1 is a side elevation showing one form of my improvements embodied in a folding last. Fig. 2 is a vertical longitudinal section thereof. Fig. 3 is a horizontal section taken in line 3—3, Fig. 1. Fig. 4 is a vertical transverse section taken in line 4—4, Fig. 1. Fig. 5 is a fragmentary side elevation showing a modification of my improvements. Fig. 6 is a vertical transverse section in line 6—6, Fig. 5.

Similar letters of reference indicate corresponding parts throughout the several views.

A and B represent the front or toe section and the rear or heel section, respectively, of the last. These two sections are cut from a single piece of wood and pivotally connected with each other, so that they may be folded relatively to each other for inserting the same into a shoe or removing the same therefrom and unfolded while in the shoe so as to properly support the same while the sole is being applied to the upper.

In forming the last a substantially V-shaped gap *a* is first cut into the top part of the wooden block from which the last is made so as to form a clearance space which permits the last sections to fold toward each other on their opposite sides. The two last sections are then separated from each other so as to form a pair of forwardly projecting integral curved knuckles *b* on the front end of the rear section between the top and bottom thereof, and a pair of curved sockets *c* which are arranged on the rear end of the front section between the top and bottom thereof and which receive the knuckles of the rear section. The front and rear sections of the last are preferably pivotally connected with each other by means of a pivot screw having a vertical flattened circular eye *d* arranged centrally between the sockets of the front last section and the knuckles of the rear last section and provided with a forwardly projecting screw threaded shank *D* which is secured in the rear end of the front last section, and a

pintle or pivot pin *e* extending transversely through the knuckles and the eye of the pivot screw.

In severing the front and rear sections of the last from each other for producing the knuckle and socket joint between the same, an opening or hole *f* is first bored horizontally and transversely through the block from which the last is made at a point in front of the pivotal connection between the last sections. An upper curved saw cut *g* is then made from a point adjacent to the lower front corner of the gap *a* to a point a short distance in rear of the hole *f*. A lower curved saw cut *h* is now produced which extends from the hole *f* downwardly and rearwardly below the pivotal connection between the last sections, this cut being produced by first passing a saw through the hole *f* and working from thence downwardly and rearwardly to a point below the last pivot. A substantially upright saw cut *i* is now produced which begins at the underside of the last and terminates at its upper end in rear of the lower curved saw cut *h*. After the block has been thus cut the same is subjected to sufficient pressure to produce a break or fracture *j* between the hole *f* and the lower end of the upper curved cut *g* and another break or fracture *k* between the rear end of the lower curved cut *h* and the upper end of the straight or upright cut *i*. It follows from this construction that when the two last sections after being pivotally connected and assembled and straightened or unfolded into their normal position the broken joints *j*, *k* engage directly with each other and form positive stops which fit each other perfectly, inasmuch as no material has been removed at these points and the two parts of the last are united exactly along the line of fracture which was produced upon breaking apart the two sections of the last. By this means the two sections of the last when fully unfolded assume a relative position which is absolutely accurate and these parts of the last are held in this position during the operation of building a shoe thereon, thereby insuring perfect workmanship. In other words by producing the co-operating shoulders *j*, *k* by breaking the last sections apart, these sections fit each other accurately and the bottom of the sections are always kept even or flush in the unfolded position of the same.

Instead of employing a hole *f* in the last for dividing the curved cut of the joint between the knuckles and sockets into two parts and forming two pairs of integral stop shoulders on each side of the last, as shown in Fig. 1, this cutting operation may be modified, as shown in Fig. 5. In this last mentioned figure only a single curved cut *l* is employed, the same extending in a curve from a point adjacent to the lower front

corner of the gap forwardly, downwardly and rearwardly to a point below the last pivot and terminating short of the upper end of the upright saw cut *m*. In this case the two sections of the last are broken apart only on the line *n* between the curved saw cut *l* and the straight saw cut *m* and when the last sections are straightened the same engage each other directly by the stop faces at the single broken joint *n*.

The bottom *o* of the gap *a* is cut on a curve of smaller radius than the other curved parts of the cut between the two last sections so as to form a rearwardly facing shoulder *o*¹ between the curve *o* and the adjacent curved cut *g* of larger diameter. This shoulder *o*¹ is in line with the upper rear face of the front last section and in the unfolded condition of the last, is engaged by the lower end of a plate *P* which is secured radially or substantially so to the upper part of the rear end of the front last section by screws *p*, as shown or otherwise. The plate *P* and shoulder *o*¹ therefore serve as an additional stop or support which prevents the toe part of the last from tipping up and the opposing bottom portions of the last from being pressed out of line when the leveling machine rolls over the bottom of the last during the operation of building a shoe thereon. This plate may be set in a recess *q* in the upper part of the rear end of the front last section so that its rear side is flush with this end of the last, as shown in Figs. 1 and 2, or the front last section may be unrecessed and the plate secured thereto with its front side flush with the rear end of the front last section, as shown in Fig. 5.

The lower or inner edge of the plate *P* bears against the upper side of the knuckles, thereby supporting the knuckles and preventing splitting of the same. This plate also takes up the slack between the upper parts of the knuckles and the sockets due to the upper part of the saw cut *g* between the same, thereby holding the last sections rigidly in place relatively to each other and relieving the pivot pin *e* of undue strain.

Centrally on the lower edge of the plate *P* the same is provided with a notch or recess *r* which receives the upper peripheral part of the eye of the pivot screw. By this means this plate is caused to straddle the screw eye and hug the same tightly, whereby the pivot screw is prevented from turning out of place and the front and rear sections of the last are held tightly in place and prevented from wiggling relatively to each other.

Various means may be provided for locking the last sections in their unfolded position. The means for this purpose shown in Figs. 1-4 comprise a vertically swinging latch *S* pivoted at its rear end to the rear

last section near the top thereof while its front end projects into a cavity *s* formed in the opposing part of the front last section. The front end of the latch is adapted to engage with a notch *t* formed centrally in the upper edge of the plate *P* and on its underside the latch is provided with a notch *u* which is adapted to receive the plate *P* at the bottom of the notch *t*. When the last sections are unfolded fully the latch may be depressed so that its notch engages with opposite sides of the plate *P*, thereby not only holding the last sections in their unfolded position but also holding the same against further movement in the direction in which the sections are unfolded, thus aiding the plate, and shoulders *o*¹, *j*, *k*, in resisting the tendency of the leveling machine to crush, break or distort the last while the latter is against the bottom of the same and the last is supported at the heel and toe part. The notch in the plate which receives the latch is preferably of such depth that the latch always remains in engagement with the same both when the latch is interlocked by its notch *u* with the plate or unlocked therefrom, thereby maintaining the latch always in the proper position relatively to the plate for interlocking therewith.

For the purpose of permitting the last to be folded the latch is raised so that its notch *u* is disengaged from the plate *P*. After the last sections are unfolded the latch may be reengaged with the plate *P* for holding the sections in this condition by simply pressing the latch inwardly by hand. This, however, is preferably effected automatically by a spring device which preferably consists of a follower *v* guided in the lower part of a guide way or socket *V* formed in the upper rear part of the front last section and bearing against the upper side of the latch at the front end thereof, a plug *w* closing the outer end of said guide-way and a spring *w*¹ arranged in said guide-way and bearing at its upper end against the plug while its lower end bears against a follower. The instant the notch of the latch is arranged in line with the upper edge of the plate *P* upon unfolding the latch sections the resilience of the spring *w*¹ acting against the follower *v* causes the latch to be depressed so that its notch engages with the locking plate, thereby effecting the locking of the latch automatically and saving the time of the workman which would otherwise be required for this purpose, thereby facilitating the manipulation of the last and reducing the cost of manufacturing shoes accordingly.

If desired the latch may be held in its operative position in engagement with the locking plate by means of a manually operated catch or detent device *x* which is piv-

oted to swing transversely at its upper end on the upper rear part of the front last section while its lower end may be moved laterally into a position over the latch for holding the same in place, as shown in full lines in Fig. 6, or to one side of the latch, as shown by dotted lines in the same figure.

My improved last is very much stronger than the lasts heretofore in use, it is not liable to break down and become useless under the severe strains to which the same is subjected, it can be produced at comparatively low cost and can be manipulated very quickly, thereby effecting a considerable saving in the maintenance of lasts, and also effecting a material saving in the time of the workmen.

I claim as my invention:

1. A last comprising front and rear pivotally connected sections, one of said sections having a circular knuckle and the other a circular socket which receives said knuckle said sections being constructed from a single block and the joint between said sections comprising a part which is cut and another part which is broken.

2. A last comprising front and rear pivotally connected sections, one of said sections having a circular knuckle and the other a circular socket which receives said knuckle said sections being constructed from a single block and said sections having some parts thereof in the joint between the same engaging with each other while other parts in said joint are out of engagement with each other.

3. A last comprising front and rear pivotally connected sections, said sections being separated at the top by a gap and said rear sections having a curved knuckle and the front a curved socket which receives said knuckle, the joint between said sections comprising a curved cut terminating below the pivotal connection between said sections, an upright cut extending upwardly from the bottom of the last, and a broken part extending from the curved cut to said upright cut.

4. A last comprising front and rear pivotally connected sections, said sections being separated at the top by a gap and said rear sections having a curved knuckle and the front a curved socket which receives said knuckle, the joint between said sections comprising an opening arranged in front of the pivotal connection between said sections, an upper curved cut extending from the front side of said gap downwardly and terminating in rear of said opening, a broken part extending from the lower end of said upper curved cut to said opening, a lower curved cut extending downwardly from said opening to a point below the pivotal connection between the last sections, an upright cut extending from the bottom of the last up-

wardly, and a broken part extending from the rear end of said lower cut to the upper end of said upright cut.

- 5 5. A last comprising two pivotally connected sections which are separated at the top by a gap and one of said sections having a curved knuckle which is provided with a shoulder adjacent to said gap, and the other section having a curved socket which re- 10 ceives said knuckle, and a plate secured to the last section having the socket and adapted to be engaged by the shoulder of the knuckle in the unfolded position of the last sections.
- 15 6. A last comprising two pivotally connected sections which are separated at the top by a gap, one of said sections having a curved knuckle and the other a curved socket which receives said knuckle, and a 20 radial plate secured to the last section having the socket and engaging with the periphery of the curved knuckle.
- 25 7. A last comprising two pivotally connected sections which are separated at the top by a gap and one of said sections having a curved knuckle which is provided with a shoulder adjacent to said gap, and the other section having a curved socket which re- 30 ceives said knuckle, and a radial plate secured to the last section having the socket and engaging with the periphery of the knuckle and adapted to be engaged by the shoulder of the knuckle in the unfolded position of the last sections.
- 35 8. A last comprising two pivotally connected sections which are separated at the top by a gap and one of said sections having a curved knuckle which is provided with a shoulder adjacent to said gap, and the other 40 section having a curved socket which receives said knuckle, a pivot screw having an eye arranged axially in line with said socket and knuckle and having a screw shank which is secured in last section having the 45 socket, a pivot pin extending through said eye and knuckle, and a plate secured to one of the last sections and having a recess in its edge whereby the same engages with the peripheral part of said screw eye.
- 50 9. A last comprising two pivotally connected sections which are separated at the top by a gap and one of said sections having

a curved knuckle which is provided with a shoulder adjacent to said gap, and the other section having a curved socket which re- 55 ceives said knuckle, a plate secured to one of said last sections, and a latch pivoted on the other last section and having a notch adapted to engage with said plate.

10. A last comprising two pivotally con- 60 nected sections which are separated at the top by a gap and one of said sections having a curved knuckle which is provided with a shoulder adjacent to said gap, and the other section having a curved socket which re- 65 ceives said knuckle, a plate secured to one of said last sections and having a notch and a latch pivoted on the other last section and arranged in the notch of said plate and having a notch which receives the plate at the 70 bottom of said notch.

11. A last comprising two pivotally connected sections which are separated at the top by a gap and one of said sections having a curved knuckle which is provided with a 75 shoulder adjacent to said gap, and the other section having a curved socket which receives said knuckle, a latch for holding said last sections in an unfolded position, and a pressing device which tends to constantly 80 move said latch into its operative position.

12. A last comprising two pivotally connected sections which are separated at the top by a gap and one of said sections having a curved knuckle which is provided with a 85 shoulder adjacent to said gap, and the other section having a curved socket which receives said knuckle, a plate secured to one of said sections, a latch provided on the other section, and a pressing device for hold- 90 ing said latch in engagement with said plate comprising a follower bearing against said latch and arranged in a guide socket in the adjacent last section, a plug closing the outer end of said socket, and a spring ar- 95 ranged in said guide socket and bearing at its opposite ends against said plug and follower.

Witness my hand this 12th day of March, 1910.

RUDOLF CARI.

Witnesses:

THEO. L. POPP,
ANNA HEIGIS.